

# STRUCTURE AND METHOD FOR MANUFACTURING PLANAR SOI SUBSTRATE WITH MULTIPLE ORIENTATIONS

## Abstract

The present invention provides a method of forming a substantially planar SOI substrate having multiple crystallographic orientations including the steps of providing a multiple orientation surface atop a single orientation layer, the multiple orientation surface comprising a first device region contacting and having a same crystal orientation as the single orientation layer, and a second device region separated from the first device region and the single orientation layer by an insulating material, wherein the first device region and the second device region have different crystal orientations; producing a damaged interface in the single orientation layer; bonding a wafer to the multiple orientation surface; separating the single orientation layer at the damaged interface; wherein a damaged surface of said single orientation layer remains; and planarizing the damaged surface until a surface of the first device region is substantially coplanar to a surface of the second device region.